# CD - Further algebra and functions

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| **How do the roots relate to coefficients for quadratics, cubics, and quartics?** | *The proof for the quadratic roots is shown below:*    *The proof for the cubic and quartics are similar.* |
| **What results should you know for the roots topic?** |  |
| **When can L’Hopital’s rule be used?** | This may be used alongside Maclaurin expansion. |
| **How can you transform linear and reciprocal roots?** | **Example:** |
| **How can you find maximums and minimums without calculus?** | 1. Say f(x) intersects y = k so f(x) = k. 2. Consider the determinant. |
| **How should you deal with double inequalities?** | Consider each case seperately. |
| **How can conics be translated?** | * Replacing f(x) by f(x - c) in an equation translates the curve c units in the x-direction. Similarly, replacing g(y) by g(y - c) translates the curve c units in they-direction. * Replacing f(x) by f(x/k) in an equation will stretch the curve by scale factor k in the x-direction. Similarly, replacing g(y) by g(y/k) will stretch the curve by scale factor k in they-direction.   **Examples of this includes:** |
| **How can you rotate conics by multiples of 90°?** | *This relates nicely to matrices.* |